

Notice of Allowability

Application No.

10/682,017

Examiner

Sarah J. Chisdes

Applicant(s)

RUEGER ET AL.

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2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application submitted 09 October 2003.
2. ☒ The allowed claim(s) is/are 1-39.
3. ☒ The drawings filed on 09 October 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

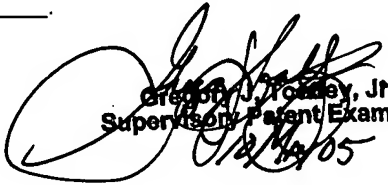
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 050905.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Gregory J. Padden, Jr.
Supervisory Patent Examiner

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John Rariden of Fletcher Yoder on May 5, 2005.

The application has been amended as follows:

In the title "spectrometry" has been changed to --spectroscopy--

In the abstract,

line 1, "associated a plasma" has been replaced with --associated with a plasma--

line 2 "may be" has been replaced by --are--

line 3 "may be" has been replaced with --is--

line 5 "may be" has been replaced with --are--

In the specification

page 3 line 15 "(SiN_x)" has been replaced with --(Si_xN_y)-- ,

"silicon dioxide (SiO_x)" has been replaced with --silicon oxide (Si_xO_y)--

"(SiO_xN_y)" has been replaced with --(Si_xO_yN_z)--

page 4 line 14 "from" has been replaced with --form--

In the claims

claim 1, last line "may be" has been replaced with --are--

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page 5 of claims, line 4 (in claim 22) "if so" has been replaced with --if at least one reactive species is present--

page 6 of claims, line 16 (claim 30) "if so" has been replaced with --if at least one reactive species is present--

page 8 of claims, line 6 (claim 38) "if so" has been replaced with --if at least one reactive species is present--

page 8 of claims, line 15 (claim 39) "if so" has been replaced with --if at least one reactive species is present--

Drawings

The drawings submitted on October 9, 2003 are acceptable and have been placed of record in the file.

Allowable Subject Matter

Claims 1-39 are allowed.

The following is an examiner's statement of reasons for allowance:

Claim 1 discloses a plasma generating system including a spectrometer to receive emissions from the plasma and generate one or more emission spectra which are used to determine precursor disassociation. Optical emission data from a plasma is commonly used to monitor a plasma during the course of a procedure, but has not been used during the formation of a plasma to monitor the disassociation of precursors consistent with all the limitations disclosed in the present application. Hikosaka (JP 07297173A) determines the dissociation of a gas in a plasma, but only after the plasma ceases to exist. After the formation of the plasma, Hikosaka

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removes the species from the chamber and analyzes them via mass spectrometry to determine what species were present in the plasma.

The other independent claims, 12, 18, 22, 30, 38, and 39, all specify the use of optical emissions spectra from the plasma to determine if reactive species are present in the plasma. The reactive species are created by the dissociation of precursors, so the determination of precursor dissociation is the same as the determination of the presence of the reactive species. Therefore the reasoning set forth above for the allowability of claim 1 also applies to the other independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cruse (US 5,910,011) and Sonderman (US 6,818,561) are representative of the use of optical emission spectroscopy in silicon wafer processing.

Telephone/Fax Information

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah J. Chisdes whose telephone number is 571-272-8540. The examiner can normally be reached on 9am -6:30pm Monday through Thursday, and 9am-5:30pm on alternate Fridays.

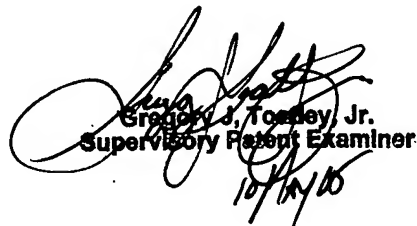
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sarah J. Chisdes, Ph.D.
Examiner
Art Unit 2877

May 9, 2005



Gregory J. Toatley, Jr.
Supervisory Patent Examiner
10/18/05